

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 1742	:	
	:	
Examiner J. Roe	:	COBALT-NICKEL-MOLYBDENUM
	:	ALLOYS WITH REDUCED LEVEL
In re Application of Forbes Jones et al.	:	OF TITANIUM NITRIDE INCLUSIONS
	:	
Serial No. 10/656,918	:	
	:	
	:	Confirmation No. 8375
Filed September 5, 2003	:	

DECLARATION OF EDWIN SNAPE, Ph.D.

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

1. I, Edwin Snape, declare as follows:
2. I am a citizen of the United States and currently reside at 73 Clubhouse Drive, Hingham, Massachusetts 02043.
3. I am over the age of eighteen and am competent to makes the statements in this Declaration.
4. In 1963 I received a B.S. degree in metallurgy from Leeds University. In 1965 I received a Ph.D. degree in metallurgy, also from Leeds University.
5. For 15 years following my Ph.D., I worked for International Nickel as a research metallurgist, research manager, business development manager, and Vice President. Throughout this period I was involved in the development of new alloys for a variety of applications

6. Patents on which I am named an inventor in the metallurgy area include U.S. Patent No. 4,816,106, "Strong, Corrosion Resistant Alloy", naming Edwin Snape as the sole inventor.

7. Through my previous employment I have gained a substantial background in and understanding of compositions, preparation, and processing of alloys and, in particular, alloys including substantial concentrations of chromium, nickel, and/or cobalt.

8. I have thoroughly reviewed United States patent application Serial No. 10/656,918 ("the '918 application"), which was published as Publication No. US 2005/0051243, including the claims currently under examination by the U.S. Patent and Trademark Office in the '918 application. I am thoroughly familiar with United States Patent No. 3,816,106 ("the '816 patent"), on which I am named the sole inventor, and am well acquainted with the subject matter described therein. I also have thoroughly reviewed United States Patent No. U.S. Patent No. 4,474,733 ("the '733 patent") and have acquainted myself with the subject matter described therein.

9. I understand that the patent examiner in the '918 application concludes that certain teachings in the '106 patent, on which I am named the sole inventor, would have motivated or otherwise suggested to a person with ordinary skill in metallurgy adding 0.02-1 wt. % of aluminum and/or 20-50 ppm magnesium to an MP35N alloy (UNS R30035). For the following reasons, I do not believe that teachings in the '106 patent would have motivated an ordinarily skilled person in metallurgy to modify the composition of an MP35N alloy to include one or both of the foregoing alloying additions of aluminum and magnesium.

a. The alloy of the '106 patent has a composition that is substantially different than the MP35N alloy. For example, the alloy described in the '106 patent includes 22-40 wt. % chromium and 10-25 wt. % nickel. Based on the ranges listed in the '106 patent, the alloy necessarily must include at least 15 wt. % iron. In contrast, as set out in

ASTM specification F 562-02, the MP35N alloy includes no more than 21.0 wt. % chromium, at least 33.0 wt. % nickel, and no more than 1.0 wt. % iron. Even relatively minor compositional differences between alloys can substantially alter how the individual alloys react to certain additions of alloying elements. Given this fact and the significant and substantial compositional differences between the MP35N alloy and the alloy described in the '106 patent, one of ordinary skill in metallurgy would not have concluded that the aluminum or magnesium additions taught in the '106 patent would have the same affect on the MP35N alloy as described in the '106 patent. Also, given the substantial compositional differences between the alloys, one of ordinary skill would not have looked to the '106 patent for teachings on how to modify the MP35N to improve its properties.

10. I understand that the patent examiner in the '918 application also has concluded that the teachings in the '733 patent would have motivated or otherwise suggested to a person with ordinary skill in metallurgy adding 5-500 ppm calcium to an MP35N alloy to improve hot workability. For the following reasons, I disagree that teachings in the '106 patent would have motivated an ordinarily skilled person to modify the composition of an MP35N alloy to include the foregoing addition of calcium.

a. The composition of the alloy described in the '733 patent substantially differs from the MP35N alloy. The alloy described in the '733 patent includes nickel, 0.001-0.15 wt. % carbon, 0.0005-0.05 wt. % calcium, 20.0-26.0 wt. % chromium, 4.7-9.4 wt. % cobalt, 5.0-16.0 wt. % molybdenum, and 0.5-4.0 wt. % tungsten. This composition dictates that alloy of the '733 patent includes at least about 40 wt. % and as much as about 77 wt. % nickel. In contrast, the MP35N alloy includes a maximum of 37.0 wt. % and also includes at least 29 wt. % cobalt. Given the significant and substantial compositional differences between the MP35N alloy and the alloy described in the '733 patent, and further given the affect of even small compositional differences between alloys, one of

ordinary skill would not have concluded that the calcium addition taught in the '733 patent would have the same affect on the MP35N alloy as described in the '733 patent. Also, given those substantial compositional differences, one of ordinary skill would not have looked to the '733 patent for teachings on how to modify the MP35N alloy.

b. Teachings in the '733 patent regarding cobalt actually would have suggested providing an alloy having a composition very different from that of the MP35N alloy. The following passage from the '733 patent, at column 3, lines 49-61, teaches that it is disadvantageous to include greater than 9.4 wt. % cobalt in the alloy described in that patent:

The alloys of the invention contain cobalt in an amount from 4.7 to 9.4 percent, preferably from 6.5 to 9.4 percent. The cobalt acts to enhance the high temperature strength properties of the alloys. If contained in less than 4.7 percent, desired strength-enhancing results cannot be obtained. On the other hand, if contained in excess of 9.4 percent, the resulting alloy has room temperature strength which is too high, remarkably deteriorating the cold workability of the alloys. Thus, the cobalt content has been limited to a range from 4.7 to 9.4 percent.

If one of ordinary skill were to have considered the above teaching of the '733 patent, he would have limited cobalt content in the alloy to no more than 9.4 wt. % cobalt since, as described in the passage, exceeding that concentration presumably would substantially degrade the alloy's cold workability. In contrast, the MP35N alloy includes at least 29.0 wt. % cobalt. Given this fundamental difference between the MP35N alloy and the alloy described in the '733 patent, I fail to see why one would have been motivated to modify the composition of an MP35N alloy based on

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teachings in the '733 patent. In any case, modifying the MP35N alloy in line with the teachings in the '733 patent would have resulted in an alloy including no more than 9.4 wt. % cobalt, an alloy which is no longer within the specification for MP35N alloy as per ASTM F 562-02.

11. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: Nov 18 2006

  
Edwin Snape